



# FRD ACTIVITIES REPORT

## July - September 2013



### **RESEARCH PROGRAMS**

#### ***Birch Creek Valley Wind Flow Study***

Phase 2 of the Birch Creek Valley Study ended late in the 4<sup>th</sup> quarter in preparation for redeployment of much of the instrumentation for Project Sagebrush. Final removal of all FRD instruments was completed on September 25. Final removal of all instruments provided by Washington State University was completed on September 26. The USFS Fire Sciences Laboratory plans on removing their equipment the first week of October. Some preliminary analysis of the data has been completed but a full analysis will await consolidation of all the measurement data into a database. ([dennis.finn@noaa.gov](mailto:dennis.finn@noaa.gov))

#### ***Transport and Dispersion Modeling***

The review of the HYSPLIT Radiological Software Quality Assurance plan (HYRad SQA) and its gap analysis required for inclusion in the DOE Emergency Managers Issues Special Interest Group (EMI SIG) Subcommittee on Consequence Assessment and Protective Actions (SCAPA) Consequence Assessment Model Toolbox is still pending. It was submitted to SCAPA during the second quarter. ([dennis.finn@noaa.gov](mailto:dennis.finn@noaa.gov))

#### ***Project Sagebrush***

The last quarter of the fiscal year involved a significant amount of preparations for Project Sagebrush. Phase 1 of the project is taking place this October at the tracer release facility located at the Idaho National Laboratory (INL). The facility has established sampling arcs extending out to 3200 m from the release point, but these arcs have generally not been used in many years. The arc roads were inspected to ensure they are still usable and that the surveyed sampler locations at 1 degree intervals were still visible. For Sagebrush, tracer samplers will be placed at 3 degree intervals on five arcs.

A NEPA Categorical Exclusion for the project was completed in coordination with DOE-Idaho and the INL site contractor. Inspections by experts in local sensitive wildlife species and archeological artifacts were completed as a requirement for NEPA approval. The reporting of the amount of SF<sub>6</sub> used during the field experiment will be provided to NOAA to comply with federal green house gas reporting requirements.

Refurbishing was completed on the 160 bag samplers that will be placed on the arcs. FRD also has ten Trace Gas Analyzers (TGAs) that provide fast-response measurements of concentration fluctuations. However, only six of these are still in working condition. The meteorological instrumentation that will be supporting the project include the NOAA/INL Mesonet, sonic anemometers, sodars, a 915 MHz radar

profiler, and a GRAW radiosonde system. Many of the sonic anemometers, some provided by Washington State University and collocated with fast-response infrared gas analyzers, have been installed at different levels on a 61 m tower near the tracer release point.

The University of Tennessee Space Institute (UTSI) offered the use of a twin-engine Piper Navajo aircraft for Project Sagebrush. It arrived in Idaho Falls the last week of September and was fitted out with a TGA. Rick Eckman will be operating this TGA as the aircraft passes through the tracer plume at various downwind distances and altitudes. ([kirk.clawson@noaa.gov](mailto:kirk.clawson@noaa.gov) and the entire FRD staff)

A webinar on Project Sagebrush was given by Rick Eckman on August 14 to all of ARL. The presentation included the history of Project Prairie Grass upon which Project Sagebrush is based. The presentation also included the ways in which we will improve upon Project Prairie Grass, including the use of real-time analyzers and turbulence measurement equipment.

An abstract entitled “Project Sagebrush: Revisiting Short-range Dispersion Using Modern Instrumentation” has been submitted for the 94th American Meteorological Society Annual Meeting next February in Atlanta, GA. It provides a general overview of the project and is part of the 18th Joint Conference on the Applications of Air Pollution Meteorology with the A&WMA. ([kirk.clawson@noaa.gov](mailto:kirk.clawson@noaa.gov), Rick Eckman, Dennis Finn, Roger Carter)

### ***ARL Convective Initiation Project***

An initial workshop for the ARL Convective Initiation project was held in Oak Ridge, TN in early September. It included attendees from the National Weather Service, Earth Systems Research Laboratory, National Severe Storms Laboratory, and the University of Alabama in addition to staff from the ARL divisions. FRD’s involvement in the project will be related to evaluating model skill in forecasting convective initiation, with a particular focus on land-surface and boundary-layer parameterizations. A postdoctoral associate will be hired to assist with the modeling effort. Ideally this associate will be stationed at FRD, but either ATDD or ARL Headquarters are also possibilities depending on the pool of applicants. ARL is also requesting core hours on NOAA high-performance computers to run model simulations of convective initiation. Some of the modeling may be based the High Resolution Rapid Refresh (HRRR) model run by the Global Systems Division at the Earth Systems Research Laboratory. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov))

### ***Wind Forecast Improvement Project (WFIP)***

FRD completed an analysis of wind data collected at three sites in Texas during WFIP, a wind-energy study sponsored by the Department of Energy. A short report summarizing this analysis was prepared for inclusion as a section in the final overall WFIP project report. The analysis included seasonal variations in sensible heat and momentum fluxes, estimation of the value of the exponent in the wind speed power law, and estimation of the errors associated with using logarithmic wind speed profile relationships and surface flux measurements to predict hub height winds. Flux data from near-surface sonics were used to examine the wind profiles as a function of atmospheric stability and compare the observed profiles with expected profiles from boundary-layer theory. Values for the displacement height and roughness length in these relationships were determined using a probabilistic regression technique. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov), Dennis Finn)

An abstract entitled “A Probabilistic Method for the Estimation of Surface Roughness and Displacement Height Using Limited Wind Profile Information” was submitted for presentation at the 94th American Meteorological Society Annual Meeting scheduled for February 2014 in Atlanta, GA. It describes some

of the wind profile analysis based on the WFIP data. Because of the linkage to wind energy, the abstract was submitted as part of the Fifth Conference on Weather, Climate, and the New Energy Economy. ([richard.eckman@noaa.gov](mailto:richard.eckman@noaa.gov), Dennis Finn, Kirk Clawson)

## **NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP**

### ***INLViz, MIDFF, HYSPLIT, and Viz+***

INLViz was set to be sunset on September 30, but some of the facilities that depend on access to real-time NOAA/INL Mesonet data were having problems with various parts of Viz+, the replacement for INLViz. These problems, caused by inconsistent Internet security postures of the various INL contractors, resulted in a delay of that sunset date while the various security issues are identified and mitigated. These security issues include the erasure of Adobe Air (required to be installed for Viz+) by the regular virus and vulnerability security scans of BEA computers, and the blocking of Google Maps calls (required to display Viz+ data on a map) by ITG. The sunset of INLViz has been delayed for three months. ([Brad.Reese@noaa.gov](mailto:Brad.Reese@noaa.gov), and Kirk Clawson)

Viz+ received a significant upgrade during the quarter. A distance utility was added to calculate the distance between two or more points. A utility to place a circle with a specified radius on a map was added to aid emergency managers in determining the location of an evacuation or shelter in place zone around a given facility. The data from all of the levels of the three tall towers can now be displayed in graph form, either in a time-based or height-based format. The ability to view historical meteorological data on a map in 5-minute time steps with the click of a mouse button was added. Last but not least, a help button was added that contains an explanation of the functions and operations of Viz+. ([Brad.Reese@noaa.gov](mailto:Brad.Reese@noaa.gov))

### ***Emergency Operations Center (EOC)***

Three sets of “canned weather” were created for use by the emergency response organizations at the Idaho National Laboratory. These were used for emergency response drills and exercises on July 10, July 16, and August 21. These data sets are designed to reflect the conditions that they need for the drill scenario. They are loaded on to the FRD server and are displayed on the participants’ computers exactly as real weather measurements are displayed. ([Roger.Carter@noaa.gov](mailto:Roger.Carter@noaa.gov))

The EOC was activated on July 8<sup>th</sup> for a security event out on the INL. Team A provided nowcasts and short term forecasts during the activation. No dispersion model runs were needed during the emergency. The event lasted approximately 2 hours. ([Jason.Rich@noaa.gov](mailto:Jason.Rich@noaa.gov))

The Annual INL exercise was conducted at the EOC on July 10<sup>th</sup>. The exercise centered on an explosion in a boiler room that caused the chemical cyclohexylamine to be released at the SMC facility. Simulated weather was used. The NOAA meteorologist ran several ALOHA dispersion plume models during the drill for evacuation purposes. ([Kirk.Clawson@noaa.gov](mailto:Kirk.Clawson@noaa.gov))

Team C participated in a drill located at the EOC on September 10<sup>th</sup>. The drill centered on a gas bottle explosion and fuel spill at the MFC facility. Nowcasts and short term forecasts were provided during the drill. ([Kirk.Clawson@noaa.gov](mailto:Kirk.Clawson@noaa.gov))

The EOC was activated on September 20<sup>th</sup> for an actual emergency caused by a fire in a building at AMWTP. The fire was isolated to a work area where retrieved buried waste is categorized and repackaged for eventual disposal. Nowcasts and short term forecasts were provided. A Hysplit

dispersion model run was created but not used during the event because the radioactive material was kept within the building and its air filtration system. The event lasted approximately 5 hours. ([Kirk.Clawson@noaa.gov](mailto:Kirk.Clawson@noaa.gov))

Team A participated in a drill at the EOC on September 25<sup>th</sup>. This drill centered on a tornado that damaged some buildings at the CFA facility. Propane fuel was reported to have been leaking from one of the damaged buildings. An Aloha dispersion model run was generated because of the propane release. Nowcast and short term forecasts were provided using canned weather. ([Jason.Rich@noaa.gov](mailto:Jason.Rich@noaa.gov))

### ***INL Hazardous Weather Alert System***

The NOAA/INL Weather Center issued 16 hazardous weather statements during the last quarter. Nine of the statements were issued due to lightning on or in the vicinity of the INL and the other 7 statements were issued for high winds (sustained winds above 25 mph). ([Jason.Rich@noaa.gov](mailto:Jason.Rich@noaa.gov) and [Dennis.Finn@noaa.gov](mailto:Dennis.Finn@noaa.gov))

### ***NOAA/INL Mesonet***

The Rexburg Community Monitoring Station at the Madison Middle School was decommissioned in the month of July. The meteorological equipment was removed from the tower and placed into the spare parts inventory. The tower was dismantled, removed, and placed into our mobile tower inventory. Other atmospheric monitoring partners moved their equipment during the quarter from the Rexburg site to the Sugar City NOAA/INL Mesonet station.

## **OTHER ACTIVITIES**

### ***Safety***

The video “Hazard Recognition” by Industrial Training Systems Corporation was viewed during the July staff meeting.

At the August staff meeting, the handout titled “Meditation: A Simple, Fast Way to Reduce Stress” was distributed.

During September’s staff meeting, employees viewed “Gravity Kills – Defy It” by Miller Basics Inc.

### ***Training***

Donna Davis participated in the WorkLife4You Stress Relief and the Mind-Body Connection Webinar on July 10<sup>th</sup>.

During the months of July and August, Roger Carter, Kirk Clawson, Donna Davis, Dennis Finn, Brad Reese, Jason Rich and Shane Beard completed the required HAZCOM training.

Kirk Clawson and Donna Davis attended the “Sunflower CD-52 Retirement Training – PM Session in July. The training was mandatory for all OAR Property Officials.

As a Hiring Manager, Kirk Clawson completed the required online training on Uniformed Services Employment and Reemployment Rights Act (USERRA) as well as Veterans’ Preference in August.

In August Rick Eckman completed a series of training courses required to fly as a NOAA employee onboard the University of Tennessee Space Institute aircraft that will be used in Project Sagebrush. Employees operating instrumentation on such aircraft are designated as “qualified non-crewmembers” and must complete training provided by the NOAA Office of Marine and Aviation Operations.

On September 5, 2013, Donna Davis participated in “Creating a Positive Work Environment” webinar.

All federal employees, along with contractors completed the FY2013 NOAA Information Technology Security Awareness training during the reporting quarter.

### ***Travel***

Richard Eckman traveled to Oak Ridge, Tennessee to attend a Sandy Supplement meeting on September 3 – 6, 2013.

### ***Misc.***

Lois Peterson, Lease Administration Manager for GSA visited our office on July 18. Purpose of the visit was to familiarize her with the facility, as she is our point of contact for our new GSA lease.